1946

A NEW CHEAP MANURE.

Particularly adapted for the Counties of
Leiceſter, Derby, Nottingham and Rutland,
AND THE ADJOINING COUNTIES.

A TREATISE ON ALABASTER, OR GYPSUM.

Deſcribing its powerful Effects,
AS A VERY CHEAP MANURE,
FOR
CORN and LAND in general,
And particularly for
GRASS LANDS,
Proved by a Variety of Experiments.

By RICHARD WESTON,
Secretary to the LEICESTER AGRICULTURE SOCIETY

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1791.
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BRITISH MUSEUM

To

The Right Honorable

LORD RAWDON, Preſident,

WILLIAM POCHIN, Eſq;

J. PEACH HUNGERFORD, Eſq;

Vice-Preſidents,

And

The reſt of the Noblemen and Gentlemen,

Subſcribers to the

LEICESTER AGRICULTURE SOCIETY,

This Treatiſe on Alabaſter, is moſt

reſpectfully addreſſed, by

My Lords and Gentlemen,

Your moſt obedient, and

moſt devoted humble ſervant,

RICHARD WESTON.

Leiceſter, Auguſt 1, 1791.

To Country Gentlemen, Farmers, and Graziers.

AN account of experiments will be eſteemed a particular favor, addreſſed to any of the publiſhers of this treatiſe, as they are intended to be continued ina future publication.

The experiments already made in America, when the plaſter was ſown before ploughing, on the ground intended for corn, do not appear to have been productive the firſt year, although for many ſucceſſive years afterwards, they have anſwered very well; but a late experiment, made near Epping this year, proves that it may be attended with great ſucceſs on corn, the firſt year, and is of material conſequence to be known to every cultivator of land.

Late in April laſt, eight buſhels of Oats were covered with water in a trough; the next morning the water was drawn off, and they were left in a heap to dry for an hour; then, one buſhel of powdered Plaſter was thrown on, in ſmall quantities, till they were dry enough to be ſown. Eight buſhels more were ſown with unprepared ſeed from the ſame heap, on alternate lands.

After eight days, a viſible alteration appeared in favor of the plaſtered Oats. On the 28th of July, they were perfectly ripe and cut, while the others were green. The Oats weighed a pound and quarter more a buſhel than the unplaſtered, and produced above thirty buſhels of corn more than the other, with the expence only of a gallon of Plaſter to each buſhel of Oats.

The experiment at large will be inſerted in the continuation of theſe experiments, but it was judged expedient to inſert it now, for if it has ſuch effect on Oats, it may be ſuppoſed to have equal effect on Barley and Wheat.

A Gentleman this ſpring has alſo mixed Plaſter with his Kitchen-Garden ſeeds, before ſown, and found great advantage from it.

A
TREATISE
ON
ALABASTER, OR GYPSUM.

OF all the modern improvements in Agriculture, none ſeem to be of greater conſequence, than the late diſcovery in America, of employing Alabaſter, Gypſum, or Plaſter of Paris, (which are the various names given to it) as a manure for land, and which has lately been introduced into England.

One of the moſt pleaſing and beneficial circumſtances attending it is, that although it is produced in various parts of Europe, from which it could be imported into this kingdom, it is alſo found in many counties of England, as Leiceſterſhire, Derbyſhire, Yorkſhire, and, without doubt, in many other parts, if ſearched for, and cannot fail of being of particular benefit to thoſe places, near to which it is found, in the article of carriage; but from the ſmall quantity required, that will be no great impediment; for the Americans imported great quantities from France, which coſt them three ſhillings a buſhel.

To the county of Leiceſter it cannot fail of being a very valuable acquiſition, as there is a quarry of it near Syſton, and probably by making proper reſearches, more may be found in other places. To the northern part of the county it will be equally beneficial, as there is a quarry, I am informed, near the borders of Derbyſhire; the other parts of the county may alſo receive equal benefit, except a ſmall additional expence of carriage. The county of Derby alſo abounds with it in various places.

Deſcription of the beſt ſort, and method of trying it.

FROM the experiments made in America, it is found that that which is produced near the ſurface of the ground has not the qualities neceſſary for vegetation in ſo powerful a manner, as that which is dug deeper, on account of the ſun, froſts and atmoſphere weakening its virtues, and that the lumps compoſed of flat ſhining ſpecula are preferred to thoſe which are formed of round particles like ſand; but that all kinds of Gypſum, however different in exterior form or appearance have a perfect reſemblance in their chemical and eſſential qualities.

To try its quality, ſome ſhould be pulverized very fine, then put dry into an iron pot placed on the fire, and if it be good, it will ſoon boil, and great quantities of the fixed air will eſcape by ebulition.

Method of preparing it.

THE uſual method of preparing it is, by firſt ſtamping it in a ſtamping mill, and then grinding it in a common griſt-mill; but the finer it is ground, it is ſo much the better, nor muſt it be calcined, and the freſher from the quarry, the qualities will be the ſtronger. Some break it by the hand and ſift it afterwards.

The manner, quantity, and time of ſowing it.

THE method of putting it on the land is ſowing it in the broadcaſt manner, as you ſow corn, and the only care neceſſary is to make the diſtribution as equal as poſſible. A day inclining to rain is to be preferred for ſowing it; but if the weather be very dry, it ought to be moiſtened before it is ſown, to prevent it from blowing away, and the diſtribution being unequal.

From a variety of experiments already made, ſix buſhels to an acre ſeem to be the moſt approved quantity for graſs or clover; but when only half of the quantity has been uſed, its effects have been very viſible, and more productive by three tons to an acre, than ſome of the ſame land left unplaſtered. One farmer mentions that he uſed nine buſhels.

It has been ſown in every month by various perſons, from March till September, and no difference was diſcovered. By ſome, April is particularly recommended; but if clover be ſown with corn, it muſt be put on the clover, as ſoon as the corn is carried off the ground.

Its time of operation and duration.

Its effects generally appear in ten or fifteen days after ſowing, after which the growth of graſs or clover will be ſo great as to be fit for mowing in about ſix weeks.

Land has retained viſible marks of its ſuperior fertility, from five to ſeven years after being plaſtered, and in ſome places from ſeven to ten. In Philadelphia it has been practiſed twelve years, and by one farmer fifteen.

Experiments on various ſoils.

It ſhould be ſown on dry land, not ſubject to be overflowed, and it is difficult to ſay on which ſort, ſand, loam or clay, it has anſwered the beſt.

Its effects are the ſooneſt viſible on ſandy ground, and the lateſt on clayey, therefore on ſtrong clayey lands it may not be improper to lay a larger quantity, or a few buſhels more the ſecond or third year.

Its effects on Graſs Lands.

By various experiments, it operates on all other graſſes as well as on red or white clover, and acts as an immediate manure on them.

Uplands, which were worn out, and from their ſandy texture, were abandoned, have now become more valuable than the fineſt bank meadow lands. In Pennſylvania, from ſandy heights they annually cut two crops of graſs; the firſt yields two tons, and the latter one; and after ſix years the produce has not abated.

Compariſon between Dung and Plaſter.

An experiment was made by laying farm manure two inches thick on worn-out land.

Plaſter was ſown on ſome of the ſame land; each was mown twice the firſt year, and once the ſecond; but in every crop the Plaſter produced the moſt.

Some farmers are ſo prepoſſeſſed with its qualities, that they prefer giving three ſhillings a buſhel to lay it on graſs land, rather than draw out their dung.

Experiments on Barley.

On barley and clover Plaſter was ſown in April, juſt as the barley was above ground, diagonally acroſs a field of three acres, about eight feet wide; little or no difference could be obſerved in the barley; but in September following there was a ſtriking difference in favour of the Plaſter, and the clover would have afforded a good crop of hay, whilſt the remainder was but indifferent.

Another experiment was made by ſowing barley, the year after the ground was plaſtered; at harveſt the difference was aſtoniſhingly great in favour of the plaſtered.

Experiments on Buckwheat.

On buckwheat, it made it grow ſo rapidly, that it fell down, and the crop was loſt; but probably if only half the quantity of ſeed had been ſown, it might have had ſucceſs.

On another acre of buckwheat, following a crop of rye, which ground had been plaſtered on clover the year before, a very ſtriking difference was obſervable in favour of the Plaſter.

Experiments on Cabbages and Turneps.

Plaſter has been applied to crops of cabbages and turneps, and it has been found as equally effectual on them as on other crops: the time is not mentioned when it was applied, but immediately before or after the planting of the cabbages or ſowing the turneps ſeems the moſt proper.

Experiments on Clover.

Two buſhels and a half of Plaſter to an acre was ſown in March on clover, which had been ſown the preceding ſpring, leaving a piece in the middle not ſown. Where there was no Plaſter the clover was only about twelve inches high, the other part thirty-four inches.

On a field of wheat of eight acres, ſix buſhels of Plaſter were ſown on each acre, with clover-ſeed at ſpring. When the wheat was cut, the the clover was twelve inches high, and was mown in two or three weeks after.

In March, eight buſhels of Plaſter was ſpread upon two acres and a half of wheat ſtubble ground, which had been ſown the ſpring before with red clover, and yielded about the middle of June five tons of hay. A ſmall piece of ground was left unſpread with the Plaſter, to afford an opportunity of diſtinguiſhing the effects of Plaſter as a manure. From the experiment there appeared an increaſe of three tons and a half of hay, with the addition of nearly three tons more ready to cut, in all ſix tons and a half increaſe by the uſe of the Plaſter.

In April an acre of white clover was plaſtered, and produced a good crop; another acre unplaſtered afforded little but a few ſcattered weeds.

Experiments on Indian Corn.

On Indian corn it has been found of great advantage, by putting a table ſpoonful to each hill as ſoon as it appears above ground, and eight buſhels of additional corn were produced on an acre. Another experiment produced nine buſhels extraordinary, and a third ten; and the corn ripened two weeks earlier.

Experiments on Rye.

An acre of clover, which had been plaſtered the year before, was ploughed early in October once, and ſown with rye, which produced double the quantity and of a ſuperior quality to another acre unplaſtered.

An acre of white clover, which had been plaſtered with ſix buſhels, was alſo ploughed once in October and ſown with rye; at harveſt it produced ten buſhels, and another acre unplaſtered only five.

Experiments on Wheat.

From various trials on wheat, it is not poſſible to diſcover that it makes any difference when ſown on the crop; but if ſown on graſs ground, and this ground turned up and laid down in wheat, the advantage it is of to the crop is amazing: probably ſix buſhels to an acre are not a ſufficient quantity for wheat or other corn; but it does not appear that any perſon has yet applied more, except one farmer, who put nine buſhels on graſs land.

The experiments above deſcribed may be ſeen more at large, by referring to the following letters, from their reſpective authors; they are here abridged, that the method of application and the reſult may appear in a more conſpicuous manner.

Experiments on Wheat.

From various trials on wheat, it is not possible to ascertain that it makes any difference, when sown on the crop, or if sown on grass ground, and the quantity [illegible] ing, in wheat; the [illegible] crop, is ascertained [illegible] and [illegible] a sufficient quantity [illegible] other clear; but it does not appear that any person has yet applied [illegible], together with some other [illegible]

The facts in this respect [illegible] may be [illegible] the follow-ing [illegible]; they are [illegible] that the method of applica-tion [illegible] in a more con-spicuous manner.

No. 1.

Letter on the uſe of Plaſter of Paris as Manure, taken from a Publication, entitled The American Muſeum.

Having for four years paſt, made uſe of Plaſter of Paris, or Gypſum, as a manure upon different ſoils, and under different circumſtances—I ſhall beg leave to lay before you the reſult of my experiments, together with ſome obſervations, reſpecting the nature of this foſſil. I am the more anxious to comply with my duty to the ſociety in this reſpect, becauſe many of our fellow-citizens are loſing the great advantage to be derived from the uſe of this manure; entertaining an opinion, that it does not, in itſelf contain any nutriment to plants, but acts merely as a ſtimulus to the ſoil, by which, although vegetation is for a ſhort time rapidly promoted, yet the ground becomes exhauſted, and is left a dead inert maſs.

1. In the year 1785, I ſowed three acres of light ſoil, containing a little clay, with barley and clover. In the month of April, the following

year I divided the field into three parts, and ſtrewed ſix buſhels of French Gypſum on No. 1; the ſame quantity of the American Gypſum brought from the bay of Fundy, on No. 2; and left the intermediate ſpace, No. 3, without any. On cutting the firſt crop, that year, little difference could be obſerved; the ſecond crop produced double the quantity of graſs, where the Gypſum had been put; and the ſucceeding year, the difference was ſtill greater in favour of this manure. Early in October 1787, the clover lay was plowed once, about four inches deep, was ſowed with rye, and in that rough ſtate was harrowed. The rye was of a ſuperior quality, and double the quantity on No. 1 and 2, of that on No. 3. After harveſt, the rye ſtubble was ploughed, and ſowed with buckwheat, when a ſtriking difference was ſtill obſervable in favour of the Gypſum, and which continues in the preſent crop of Indian corn.

2. In April, 1787, I ſowed three acres of potatoe ground (a light loam) with barley and clover. Juſt as the barley was above ground, ſome Gypſum was ſtrewed diagonally acroſs the field, about eight feet wide. Little or no dif-

ference could be obſerved in the barley; but in the month of September following, there was a ſtriking difference in the clover, in favour of the manure, which would have afforded a good crop of hay, whilſt the remainder of the field was but indifferent. I have frequently put Gypſum upon grain, without obſerving any immediate difference in the crops.

3. In April, 1786, ſix acres of poor iſinglaſs ſoil, ſituated at German Town-hill, were ſowed with oats; the ground not having been manured for twenty years, it produced a crop not paying expences. In April 1787, one half of the field was covered with Gypſum, ſix buſhels to the acre. The latter end of the ſame ſummer, that part, on which the manure had been put, produced good paſture of blue graſs and white clover, whilſt the remainder afforded little but a few ſcattered weeds. In October, the field was plowed once, and ſowed with rye; at harveſt, the former produced ten buſhels to the acre, the latter not above five.

4. A field of fifteen acres, a light loom, was, in April, 1784, ſowed with barley and clover, the produce only twenty buſhels to an acre; the ground not having been ſufficiently manured. In 1785, it produced a good firſt, and a tolerable ſecond crop of clover. In 1786, the firſt crop but tolerable; the ſecond very indifferent, and ſo therefore paſtured. In the ſpring, 1787, I wiſhed to try if Gypſum would not renew the clover. In the month of April, the whole field was covered with Gypſum, ſix buſhels to the acre, except the width of twenty feet, through the middle of the field. St. John's wort, mullein, and other weeds had taken ſuch poſſeſſion of the ground, that although the manure produced a great luxuriance of graſs, yet, being full of weeds, it did not anſwer for hay; and therefore was paſtured until October, 1788: the whole was then ploughed eight inches deep, with a ſtrong three-horſe Dutch plough: laſt April it was well harrowed, and croſs-ploughed four inches deep, with a light two-horſe plough, leaving the ſod at the bottom. The field was ſowed with ſpring barley; at harveſt, the difference of the crop was aſtoniſhingly great in favour of the part where the Gypſum had been

put, two years before. This ground is now under wheat and winter barley, which have a promiſing appearance: the rotted ſod being turned up and mixed with the ſoil, affords a ſtrong nouriſhment to the preſent crop.

5. I put a quantity of Gypſum three years ago, on ſeveral ſmall patches of tough ſod; it produced a difference in the ſtrength of vegetation, which is ſtill obſervable. From the above recited experiments it appears—

1ſt. That there is no difference between the European and the American Gypſum.

2d. That Gypſum acts as an immediate manure to graſs, and afterwards in an equal degree to grain.

3d. That one dreſſing will continue in force ſeveral ſucceeding crops.

Gypſum, not producing any remarkable beneficial effects, when uſed as a top dreſſing to grain, may ariſe from two cauſes; firſt, from the ſmall quantity made uſe of, which is loſt in the rough ground; and ſecondly, from the ſhort time of its application. It has been found of advantage to Indian corn, but in this caſe, it is abſolutely neceſſary to apply it immediately to the corn, as it appears above ground, and that in a conſiderable quantity---I have put it on graſs ground every month in the year, except during the ſeverity of winter; and have found, that early in April is preferable to any other ſeaſon; at which time the graſs juſt ſhooting, the ſmall particles of the Gypſum are detained about the roots, and prevented from waſhing away. On ſtiff clay ſoils, it will produce an increaſe, but not ſufficient to pay the expence of the manure.

It may be difficult to point out the origin of Gypſum, or to aſcertain clearly the principle, on which its nutritive quality of vegetables depends: We ſhall, however, with diffidence ſubmit our conjectures on this ſubject to the conſideration of the ſociety.

Gypſum, which has acquired the name of Plaſter of Paris, from its abounding in the neighbourhood of that city, is of a ſtoney nature, yet ſoft, and eaſy to be ſcraped with a knife, It is found in many parts of the earth, in very great quantities, forming hills of a conſiderable extent, as in the vicinity of Paris, in the Bay of Fundy, in Ruſſia, and in many other parts of the world. It is found under different appearances.

1ſt. Chryſtalized into tranſparent plates, which can be eaſily ſeparated with a knife, and which in ſome parts of Ruſſia, are ſaid to be ſo large, as to anſwer the purpoſe of glaſs.

2d. Of a fibrous texture, and compoſed of oblong concretions, lying acroſs the maſs.

3. Compoſed of ſmall cryſtalline grains; this ſpecies is called alabaſter, when it has a a hardneſs capable of receiving a poliſh.

In Mont Martre, near Paris, all the above varieties are found, alſo a ſtratum of a leſs perfect matter, filled with ſmall ſhells; a ſpecimen of which I have in my poſſeſſion: I have alſo a beautiful ſpecimen of cryſtallized Gypſum, lately brought from the bay of Fundy.

All kinds of Gypſum, however different in exterior form or appearance, have a perfect reſemblance in their chemical and eſſential qualities.

It is generally allowed, that Gypſum is principally compoſed of calcareous earth, but is not ſo well aſcertained with what ſubſtance it is united, which prevents it from having the power of the quick lime, when burnt. Regarding calcareous earth, as forming the baſis of this ſubſtance, it may be neceſſary to take notice of the different forms under which calcareous earths appear.

That which is in the greateſt quantity, and properly called calcareous, is diſtinguiſhed from the reſt by the effect which fire has upon it, in converting it into a quick lime; all others ſhould rather be termed alkaline abſorbents. Calcareous earth appears in a variety of forms; there are very conſiderable ſtrata of it in the bowels of the earth, as marble, limeſtone, and chalk, which differ only in the degree of purity, or mode of concretion.

The

It is often found in veins, filling up the rents or cavities of mountains, and is called calcareous ſpar; ſome of which contain a quantity of this earth, but not in a pure ſtate: ſome are perfectly tranſparent; and from being found in Iceland, are called Iceland cryſtals.

The matter with which vegetable and animal ſubſtances are incruſted, or penetrated by the waters of particular ſprings, ſo as to retain their external form, but loſe their nature, and become ſtone, is generally of this kind; and ſhews that this earth is capable of being diſſolved by water, and being introduced into the texture of animal and vegetable ſubſtances. This earth alſo produces the large and pendulous columns and cones that are found hanging from the roofs of large caves, as in Derbyſhire.

The ſtoney ſhells of all cruſtaneous animals, from the coarſeſt, to the coral and pearl, are compoſed of this earth, and a ſmall quantity of animal glue. A viſcid fluid proceeds from the ſurface of the animal, which becomes a tough membrane, and gradually hardens into this form. The ſhells of all kinds of animals, together with all coraline concretions, conſiſt of the calcareous earth, united with a ſmall proportion of animal glue.

Marl is an alkaline earth, but cannot be converted to quick lime; it is compoſed of calcareous earth and clay: and its value, as a manure, is eſtimated in proportion to the quantity of calcareous earth which it contains. Marls aſſume a variety of colours, but are properly divided into ſhell and ſtone marl.

Shell marl is compoſed of the ſhells of ſhell-fiſh, or other aquatic animals, which are ſometimes entire, and often decayed, or mixed with other earthly ſubſtances.

Examining this matter, as occurring in different places, it may be diſtinguiſhed into freſh water marl and the marl of ſea-ſhells. The firſt is compoſed of a ſmall freſh-water wilk or ſnail: this animal, when alive, is not eaſily diſcoverable, the ſhell being much of the ſame colour as the ſtones covered with the water: but great numbers of them are to be found in many ſmall brooks, particularly in their paſſage through the low wet grounds: as the animal dies, the ſhell is depoſited.

The ſecond, compoſed of ſea-ſhells, conſtitutes much greater collections, and is found in innumerable places now far removed from the ſea. That moſt particularly deſcribed by naturaliſts, is a collection of this kind in Touraine, a province in France. The part of the country, where it is fonnd, contains ſeveral ſquare miles of ſurface; and wherever they dig to a certain depth, they find this collection of ſhells, compoſing a ſtrata of twenty feet thick. The country at preſent is one hundred and eighty miles from the ſea.

The ſtone or clay marls bear more or leſs reſemblance to clay; they are very various in their colour and other appearances, but agree in containing a quantity of clay united with calcareous earth, ſo as to efferveſce with acids ---the ſtone marls are harder than the clays, but upon being expoſed to the action of the ſun and froſt, they crumble into powder, which is eaſily mixed with the ſoil, though ſome of them require a long time before they are divided fine enough to be completely mixed with it.

Theſe are the principal forms in which calcareous earth is found. They all derive their origin from the calcareous matter of ſhells; for we find relics of ſhells in by far the greater number of lime-ſtones, chalks, gypſums, and marbles.

From the natural hiſtory of theſe foſſils, and their effects in promoting vegetation, we may conclude that they contain in themſelves a certain nouriſhment to plants, ariſing from a concentration of the animal glue exiſting in their original ſtate of ſhell-fiſh.

Too much pains cannot be taken to engage our farmers generally in the uſe of theſe valuable manures.

RESOLVED, as there are very extenſive beds or quarries of plaſter ſtone in ſeveral parts of the gulph of St. Lawrence, ſteps to be taken by the ſecretary to procure a ſmall quantity from different places in the gulph, that proper trials may be made of its efficacy as a manure, to be communicated to the public, if it ſucceeds, recommending to thoſe that may be employed to procure the Gypſum or plaſter ſtone, to diſtinguiſh that which may have been expoſed to the ſpray of the ſea or overflowed by the ſalt water, from that which has been wet but with the rain.

No. 2.

Extract of a Letter from a Gentleman in the State of Pennſylvania, to his Friend in Quebec.

"YOU have incloſed ſome account of the experiments and uſe of the Gypſum or Plaſter of Paris; if any further communication be neceſſary you ſhall have it.

"I ſee by an account of a late publication of Arthur Young's, he mentions it as being uſeful as a manure, but how far he has publiſhed the uſe of it in England I do not know; as yet I have not been able to procure a ſight of his treatiſe.

"This manure has produced a great revolution in agriculture. The fine watered and banked meadows in this country, are no longer held in the eſtimation they were; our dry poor uplands, from the effect of this valuable and cheap manure, are infinitely more productive and more valuable than the beſt low lands; I mean for graſs. In ſhort, the value of farm-yard manure is much leſſened, *for it is cheaper for the farmer* to purchaſe the Plaſter at two thirds of a dollar per buſhel, than to draw out his dung thereon.

"This diſcovery exceeds credibility; it puzzles the philoſopher, and aſtoniſhes the farmer. Indeed, it tells us all reaſoning hitherto extended to the principles of vegetation, was without foundation, and that the human race are in a total ſtate of ignorance reſpecting it."

Experiments on Gypſum, as a Manure.

In anſwer to your queries reſpecting Gypſum, or Plaſter of Paris, I ſhall give you as full information as I can, conſiſtent with my own and neighbour's experiments.

The beſt kind is imported from hills in the vicinity of Paris; it is brought down the Seine by water, and is exported from Havre de Grace. I am informed there are large beds of it up the Bay of Fundy, ſome of which I have ſeen nearly as good as that from France; but ſeveral cargoes brought from thence to Philadelphia, have been uſed without effect. It is probable this was taken from the top of the ground, and was by the influence of the ſun and atmoſphere, diſpoſſeſſed of the qualities neceſſary for the purpoſe of vegetation. The lumps compoſed of flat ſhining *ſpecularis*, are preferred to thoſe which are formed of round particles like ſand; when pulverized and put dry in an iron pot over the fire, that which is good will ſoon boil, and great quantities of the fixed air eſcape by ebullition. It is pulverized by firſt ſtamping it in a ſtamping mill, and then grinding it in a common griſt mill. The finer its pulverization the better; it will thereby be more generally diffuſed. It is beſt to ſow it in a wet day; but if that is not convenient, it ſhould be a little moiſtened, when you can ſow it at any time. The moſt approved quantity for graſs, is ſix buſhels per acre. No art is required in ſowing it, more than making its diſtribution as equal as poſſible on the ſward graſs. It operates altogether as a top manure, and therefore ſhould not be put on in the ſpring, until the operation of the froſt is over, nor until vegetation hath begun. The general time for ſowing it is in April, May, June, July, Auguſt, and even as late as September. Its effects will generally appear in ten or fifteen days, after which the growth of the graſs will be ſo great as to produce a large burden at the end of ſix weeks after ſowing. It muſt be ſown on dry land, not ſubject to overflow. I have ſown it on ſand, loam, and clay, and it is difficult to ſay on which it has beſt anſwered, although the effect is ſooner viſible on the ſand. It has been uſed as a manure in this State for upwards of twelve years. Its duration may, from the beſt information I can collect, be eſtimated from ſeven to ten years; for, like other manures, its continuance muſt very much depend on the nature of the ſoil on which it is placed.—One of my neighbours ſowed a piece of his graſs ground ſix years ago—another ſowed a field four years ago, a great part of my own farm was ſown in May, 1783.---We regularly mow two crops, and paſture in the autumn. No appearance of failure, the preſent crop being full as good as any preceding. I have this ſeaſon mowed about fifty acres of red clover, timothy, white clover, &c. which were plaſtered laſt May, July and September. Many who ſaw the graſs, eſtimated the produce at two tons per acre; but I calculate for the two crops three tons. Several ſtrips were left in the different fields without plaſter, theſe were unproductive, and not worth mowing.

In April 1788, I covered a ſmall piece of ground upwards of two inches thick with farm-yard manure in the ſame worn-out field. I ſowed plaſter to contraſt it with dung---I mowed the dunged and plaſtered land twice laſt year, and once this: In every crop the plaſter has produced the moſt. You will remember in all your experiments with clover, you ſhould mix about one-third timothy graſs ſeed; it is of great advantage in ſerving as a ſupport for the clover, as it prevents it from falling; it very much facilitates the airing of the clover, and when aired is a ſuperior fodder. The plaſter operates equally as well on the other graſſes as on clover. Its effect is ſaid to be good if ſown in the ſpring on wheat; but this I cannot ſay from experience. On Indian corn I know its operation to be great. We uſe it at the rate of a table ſpoonful for a hill, put on immediately after dreſſing. From ſome accurate experiments laſt year, and reported to our Agriculture Society, it appears, that nine buſhels of additional corn per acre was produced by this much of plaſter. As the uſe of this cheap and extraordinary manure has now become very general in this State, and many many accurate and judicious farmers are now making experiments therewith, I doubt not but its uſes at the cloſe of the ſeaſon will be better known, and further extended; when I ſhall be happy to make a communication thereof to you.

No. 3.

Experiments, &c. on the Plaſter of Paris, made in the Province of Pennſylvania---communicated by a Gentleman in Quebec, Member of the Agricultural Society.

Copy of a Letter from ROBERT MORRIS to JESSE LAWRENCE.

"AFTER the converſation which paſſed between thee and me, on the ſubject of Plaſter of Paris, I conceived it might have been in the year 1775, that it was recommended to me as a manure for land; I accordingly purchaſed five buſhels, yet my faith was ſo weak, that it lay by me until 1778, when in the month of March, I ſowed at the rate of two buſhels and an half per acre, on ſome ground which I had tilled and ſowed with clover ſeed the ſpring preceeding, leaving a piece in the middle not ſown, and likewiſe on each ſide. That ſeaſon, where there was no plaſter ſown, the clover ſtood on the ground about twelve inches high; but where the plaſter was ſown, the clover ſtood upon an average 34 inches high. This ground I ſowed for about four ſeaſons after; I found it to have leſs graſs every year, though that which was ſown with the plaſter, had as much more in proportion as the firſt year. I afterwards ploughed up the ground except a quarter of an acre; upon this I again put Plaſter of Paris in the year 1785, and no other manure whatever ſince 1778, and it is now in much better order than it was at that time, and has produced me about two tons of hay every year ſince, for the firſt crop, and a tolerable good ſecond crop, and ſometimes a third crop, or very good paſture; though the laſt time I manured it, I put in the proportion of ſix buſhels of Plaſter to an acre. I have likewiſe made many experiments otherwiſe; I have tried it with Indian corn, where it does tolerable well; with buck-wheat, and it makes it grow ſo rapidly, that it has always fallen down, and I have loſt my crop. I have tried it with wheat, and it is not poſſible to diſcover that it makes any difference when ſown on the crop; but when it is ſown on graſs ground, and this ground turned up, and laid down in wheat, it is amazing the advantage it is of to the crop. Laſt fall was a year, I put down about eight acres of wheat, which I harrowed in, and then ſowed clover ſeed, which came up and looked very fine in the fall; but the winter being very ſevere, with but little ſnow, the clover was dead in the ſpring; when I ſowed it again with clover ſeed, and about ſix buſhels of Plaſter of Paris to the acre, and by harveſt time I had clover all over the piece, above twelve inches high, and which I mowed in about two or three weeks after my wheat was cut; I believe I might have cut a full ton of hay off from each acre, and I am well ſatisfied, that if I had not put any Plaſter of Paris on it, I ſhould not have had any graſs that I could have cut. I have likewiſe ſold this manure to many people in this State, as well as in

New-Jerſey, Maryland, Delaware, &c. and after trial, their applications to me have been very great, which induces me to believe they have found the like benefits from the uſe of it as I have myſelf.

With reſpect, I am thy friend,

ROBERT MORRIS.

Philadelphia, Feb. 15, 1789.

I, Clement Biddle, Eſq: Notary Public for the Commonwealth of Pennſylvania, duly commiſſioned and qualified, do certify, that Robert Morris, miller and farmer, of the county of Philadelphia, by whom the foregoing writing certified by him in his hand-writing, to me well known, is a perſon of good character and reputation, and that I have been upon his farm, and have ſeen great appearance of improvement in the produce thereof, from the uſe of Plaſter of Paris, and am of opinion, that credit is due to his certificate before written, relative thereto. The ſaid Plaſter of Paris came from Nova Scotia, and is of great repute.

In teſtimony whereof, I have hereunto ſet my hand, and fixed my notarial ſeal at Philadelphia, this 18th day of February, 1789.

Signed

CLEMENT BIDDLE, Notary Public.

No. 4.

Copy of a Letter from Mr. H. Wynkoop, of Verden Hoff, Bucks County, Pennſylvania 13th Auguſt, 1787, to the Preſident of the Agricultural Society at Philadelphia.

"SIR,

"CONVINCED of the utility of the Plaſter of Paris as a graſs manure, I communicate to you for the information of the ſociety, an experiment which I lately made. In the month of March laſt, as ſoon as the ſnow was off the ground, and ſo ſettled as to bear walking upon the ſurface, I ſpread eight buſhels of the Plaſter of Paris upon two and a half acres of wheat ſtubble ground, which had been ſown the ſpring before (in common with the reſt of the field) with about two pounds of clover ſeed for paſture; this ſpot yielded about the middle of

June five tons of hay. A ſmall piece of ground within the encloſure, and a ſimilar quality, having been left unſpread with the Plaſter, afforded an opportunity of diſtinguiſhing the effects of Plaſter of Paris as a manure; for from the produce of the latter, there was good reaſon to judge that my piece of clover, without the aſſiſtance of the Plaſter, might have yielded one and a half ton of hay; ſo that the eight buſhels of the pulverized ſtone muſt have occaſioned an increaſe of three and a half tons of hay upon two and a half acres of ground, in addition to which it is now covered, to appearance, with between two and three tons fit for the ſcythe. This ſoil has been in courſe of tillage about fifty years, and never had any dung or manure upon it, but yet was what might be called good wheat land. As the effects of the Plaſter were was thus powerful upon ſuch kind of ground, there good reaſon to conclude they would be much greater upon a ſoil previouſly manured.

With due reſpect, I am, &c. (Signed)

HENRY WYNKOOP."

To the Preſident of the Agricultural
Society of Philadelphia.

I do hereby certify, that the above named Henry Wynkoop, is a perſon of undoubted good character, and worthy of credit; and I do alſo further teſtify, that the Plaſter of Paris is much uſed as a manure in the neighbourhood of Philadelphia, and that it is generally held in high eſtimation by thoſe who have tried it as a manure.

(Signed)

SAMUEL POWELL.

Philadelphia, June 30, 1789.

Preſident of the Agricultural Society.

No. 5.

AGRICULTURAL OBSERVATIONS.

AS the improvement of agriculture ought to be the object of every country, ſo the knowledge of every uſeful diſcovery ſhould be communicated to the people: the following extracts of letters received from a gentleman of veracity and a conſiderable farmer for many years in Pennſylvania, may therefore deſerve particular attention.

Extract

Extract of a letter from Philadelphia, dated Sept. 16, 1788.

"For the information of the farmers in Great Britain, I acquaint you, that nine buſhels of Plaſter of Paris, ground fine, and ſowed on graſs-ground, proves in this country preferable to any other ſpecies or quantity of manure: on ſandy or loamy ſoil land it anſwers beſt; hundreds of our farmers make uſe of it. I have made experiments on upwards of fifty acres in different parts of my farm, and all have ſucceeded beyond any manure I ever ſaw. The ſpring of the year has been eſteemed the beſt ſeaſon for ſowing it; but I have ſown it in March, April, May, June, July, Auguſt, and I know no difference in its effect. You will obſerve it is only a top manure, therefore muſt be ſown on a ſward of graſs: it is peculiarly good for white and red clover: it may be broke by hand, and afterwards ſifted, but we ſtamp it, and then paſs it through our millſtones; it muſt not be calcined. The effect is truly aſtoniſhing, and baffles both the farmer and the philoſopher. An old field of mine, in which I had wheat laſt year, was ſown with the Gypſum about ten days after harveſt; early in September I cut from it upwards of two tons of clover per acre, which was ſown on the wheat in March. Pray prevail on ſome of your gentlemen farmers to make the experiment.

Pennſylvania, June 1, 1790.

"I wrote to you ſome time ago, reſpecting our manuring with the Plaſter of Paris: I have now experienced it upwards of three years; others have uſed it upwards of fifteen: it exceeds any thing ever known. Pray prevail on ſome perſon to ſow a ſmall quantity of red clover in a dry ſoil; a few days will evince its power. Six buſhels to the acre I uſe, and it is preferable to fifty loads of the beſt dung. This you muſt think extravagant; it is ſo, and yet true. I have contraſted it for three years with dung in that proportion, and the reſult is my aſſertion: I have upwards of one hundred acres now under Plaſter, applied in various ways, and on different ſoils; it has in no inſtance failed; the laſt I made, I ſhall relate as follows:

“ In April 1789, I ploughed the end of a poor ſand hill, which by long and bad culture had been totally exhauſted; it contained no graſs, but was covered with wild onions; the next day after ploughing, I ſowed it with oats, clover, and timothy; when the oats were a few inches high, I ſowed a ſtrip through the middle of the field with plaſter; the ground being poor, the oats were not knee high at harveſt; the clover, where the plaſter was not ſown, was very ſmall and poor; but the ſtrip on which the plaſter was ſown, produced clover near as high as the oats. As ſoon as the oats were cut, I ſowed all the ſtubble with plaſter; in October the ground produced upwards of a ton and an half per acre; and I now think the crop ſuperior to the beſt acre you ever ſaw.

“ The land I ſowed three years ago, I mow twice, and paſture the bad crop; not the leaſt failure yet appears. I intend to renew a part of it, by way of experiment, with three buſhels of plaſter per acre, after my firſt mowing, which will be in eight days.

"It is generally eſteemed to continue good from five to ſeven years; it is much uſed in this country, and is travelling Weſtward and Eaſtward. I ſaw laſt week ſeveral fields done with it near Reading, in this State, about ſixty miles from the river. A ſpoonful on a hill of Indian corn, will increaſe the quantity about ten buſhels per acre, and it is found to ripen two weeks earlier. The graſs as well as hay raiſed from it, is found more nutritive than any other; ſo much ſo, that cattle fatten in near half the time. Were I to write a volume, I could not tell you all its advantages."

The ſoil of the plantation of the above writer is a loam, more or leſs mixed with ſand, having a few inches of black mould on the ſurface, and not a cold clay

The Plaſter, generally made uſe of in the United States of America, is imported from Havre de Grace. and ſome from Halifax in Nova Scotia, but of a much inferior quality, unleſs got at a certain depth. The plaſter is found in Yorkſhire, and ſome other parts of the kingdom, but whether equal in quality to that in France, experiments will diſcover,

No. 5.

An Account of the Uſe of Gypſum as a Manure.

Extract of a Letter from a Gentleman in America, to his Friend in London.

I intended to have given you an account of the uſe of Gypſum, or what is generally called Plaſter of Paris, as a manure, and the effects of it at large, but this I muſt defer to another opportunity; at preſent I ſhall only ſay, that it is the cheapeſt and moſt effectual manure yet diſcovered; ſix buſhels are quite enough for an acre. It muſt be firſt pounded in a ſtamping mill, and then ground in any common griſt mill; the finer it is pulverized the better; it muſt be ground unburnt. The method of putting it on the land is by ſowing it in the broad caſt as you ſow wheat: the only care neceſſary is to make the diſtribution as equal as poſſible. The experiments that have been made of it in America, have been chiefly on graſs; it is ſowed on the ſward as ſoon after vegetation has commenced as you pleaſe, and after that till September; it is beſt to ſow it in a drizly day, but if ſown in a dry day it ought to be moiſtened before it is ſown, to prevent its blowing away, and the diſtribution being unequal.

The effect of it will ſhew itſelf in ſix or ſeven weeks; and the product from heretofore unproductive land, will be at leaſt two tons per acre. It is almoſt equally good on all kinds of ſoil, ſand, clay, or mould, but it ſhews itſelf ſooneſt on ſand. Its continuance is from ſix to ten years, according to the nature of the ſoil, like other manure. Many experiments have been made; half of a field has been ſown with this plaſter, and the other half covered two inches thick with barn-door manure, and the plaſtered has been found moſt productive; on Indian corn the increaſe by plaſter has been eight buſhels per acre, by only putting one table ſpoonful on a hill. There is no kind of doubt but it will equally well anſwer the purpoſe on wheat, if ſown in the fall, or early in the ſpring when vegetation has commenced. The utility of this manure, and the cheapneſs of it, has in Pennſylvania depreciated the value of barn manure, as it is found much cheaper to put on this plaſter, than to cart the manure from the barn to the fields. On cabbages and turneps it is equally effectual.

By the uſe of this manure the uplands, which were worn out, and from their ſandy texture, were abandoned, have now become more valuable than the fineſt intervals, or bank meadow lands. In Pennſylvania, from ſandy heights they annually cut two crops of graſs, the firſt yields two tons, and the latter one; and after ſix years the produce has not abated.

You well know the lands in Pennſylvania, oppoſite to Trenton, which are naturally ſandy, and ſoon worn out; thoſe lands, from the uſe of the plaſter, now give the above crop, and ſome of them have been plaſtered upwards of ſix years paſt, and there is yet no diminution of the product.

The plaſter uſed in Pennſylvania, as procured from hills in the neighbourhood of Paris, and when pulverized and fit to ſow, is worth two-thirds of a dollar per buſhel; ſome has been uſed there that was collected at Nova Scotia, which was found equally ſtrong and good, while other parcels that were carried from Nova Scotia, was almoſt unproductive. The reaſon moſt probably was, that it was taken from the ſurface, where, by being expoſed to the froſts, atmoſphere, &c. &c. it had loſt its virtue. What the properties are that give it this amazingly vegetable and nutritious quality, I muſt leave to you and other naturaliſts and philoſophers to diſcover; the facts I give you, and leave you to aſſign the cauſe.

I hope to ſee the uſe of it introduced into England, and I have no doubt, but in a few years, our barren heaths will be turned into fine graſs lands, and the preſent invaluable part of the kingdom be made uſeful. The beſt kind of the plaſter is that which has ſhining flat ſpecula in it.

FINIS.

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